

IN THE CLAIMS:

Claims 2, 6, 12-41, 43-47, and 56-62 were previously cancelled. None of the claims have been amended herein. All of the pending claims are presented below for convenience of the Examiner. This listing of claims will replace all prior versions and listings of claims in the application. Please enter these claims as previously amended.

1. (Previously presented) A G-protein fusion receptor comprising:
 - a) an extracellular domain comprising an extracellular domain amino acid sequence selected from the group consisting of SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, and SEQ ID NO: 5, wherein said extracellular domain is capable of binding a native CaR, mGluR, or GABA_BR ligand;
 - b) a transmembrane domain joined to the carboxy terminus of said extracellular domain, said transmembrane domain comprising a transmembrane domain amino acid sequence selected from the group consisting of SEQ ID NO: 6, SEQ ID NO: 7, SEQ ID NO: 8, SEQ ID NO: 9, and SEQ ID NO: 10;
 - c) an intracellular domain joined to the carboxy terminus of said transmembrane domain, said intracellular domain comprising all or a portion of an intracellular amino acid sequence selected from the group consisting of SEQ ID NO: 11, SEQ ID NO: 12, SEQ ID NO: 13, SEQ ID NO: 14, and SEQ ID NO: 15, provided that said portion is at least 10 amino acids in length;
 - d) an optionally present linker joined to the carboxy terminus of said intracellular domain; and
 - e) a G-protein joined either to said intracellular domain or to said optionally present linker, provided that said G-protein is joined to said optionally present linker when said optionally present linker is present, wherein said G-protein interconverts between a GDP-bound and a GTP-bound form,

wherein said domains are functionally coupled such that a signal from the binding of a ligand is transduced to the intracellular domain when said G-protein fusion receptor is present in a suitable host cell, and wherein said intracellular domain when present in a wild type receptor does not interact with said G-protein.

2. (Cancelled)
3. (Previously presented) The G-protein fusion receptor of claim 1, wherein said optionally present linker is present and is a polypeptide 3 amino acids to 30 amino acids in length.
4. (Previously presented) The G-protein fusion receptor of claim 1, wherein said optionally present linker is not present.
5. (Previously presented) The G-protein fusion receptor of claim 3, wherein said G-protein is selected from the group consisting of: $G\alpha_{15}$, $G\alpha_{16}$, Gqo5, and Gqi5.
6. (Cancelled)
7. (Previously presented) A nucleic acid comprising a nucleotide sequence encoding for the G-protein fusion receptor of any one of claims 1, 3-5, or 42.
8. (Previously presented) An expression vector comprising a nucleotide sequence encoding for the G-protein fusion receptor of any one of claims 1, 3-5, or 42 transcriptionally coupled to a promoter.
9. (Previously presented) An isolated recombinant cell comprising the expression vector of claim 8 and a cell wherein the G-protein fusion receptor is expressed and is functional.
10. (Previously presented) An isolated recombinant cell produced by combining an expression vector of claim 8, wherein said expression vector comprises the nucleic acid of claim 7 and elements for introducing heterologous nucleic acid into a cell wherein the G-protein fusion receptor is expressed.

11. (Previously presented) A process for the production of a G-protein fusion receptor comprising:
growing procaryotic or eukaryotic host cells comprising a nucleic acid sequence expressing the G-protein fusion receptor of any one of claims 1, 3-5, or 42, under suitable nutrient conditions allowing for cell growth.

12.-41. (Cancelled)

42. (Previously presented) The G-protein fusion receptor of claim 4, wherein said G-protein is selected from the group consisting of $G\alpha_{15}$, $G\alpha_{16}$, $Gq\alpha_5$, and $Gq\alpha_5$.

43.-47. (Cancelled)

48. (Previously presented) The G-protein fusion receptor of claim 1, wherein said extracellular domain and said transmembrane domain are from a Type 2 mGluR.

49. (Previously presented) The G-protein fusion receptor of claim 1, wherein said extracellular domain and said transmembrane domain are from a Type 3 mGluR.

50. (Previously presented) The G-protein fusion receptor of claim 1, wherein said extracellular domain and said transmembrane domain are from a Type 4 mGluR.

51. (Previously presented) The G-protein fusion receptor of claim 1, wherein said extracellular domain and said transmembrane domain are from a Type 6 mGluR.

52. (Previously presented) The G-protein fusion receptor of claim 1, wherein said extracellular domain and said transmembrane domain are from a Type 7 mGluR.

53. (Previously presented) The G-protein fusion receptor of claim 1, wherein said extracellular domain and said transmembrane domain are from a Type 8 mGluR.

54. (Previously presented) The G-protein fusion receptor of claim 1, wherein said extracellular domain and said transmembrane domain are from a GABA_BR.

55. (Previously presented) The G-protein fusion receptor of claim 1, wherein said G-protein is a chimeric G-protein.

56.-62. (Cancelled)

63. (Previously presented) The G-protein fusion receptor of claim 1, wherein said extracellular domain comprises SEQ ID NO: 1, said transmembrane domain comprises SEQ ID NO: 6, and said intracellular domain comprises SEQ ID NO: 11.

64. (Previously presented) The G-protein fusion receptor of claim 1, wherein said extracellular domain comprises SEQ ID NO: 5, said transmembrane domain comprises SEQ ID NO: 10, and said intracellular domain comprises SEQ ID NO: 15.

65. (Previously presented) The G-protein fusion receptor of claim 1, wherein the G-protein fusion receptor comprises phCaR/hmGluR2*Gq_{i5}.

66. (Previously presented) The G-protein fusion receptor of claim 1, wherein the G-protein fusion receptor comprises pmGluR2//CaR*Gα_{i5}.

67. (Previously presented) The G-protein fusion receptor of claim 1, wherein the G-protein fusion receptor comprises phmGluR2//CaR*AAA*Gα_{i5}.

68. (Previously presented) The G-protein fusion receptor of claim 1, wherein the G-protein fusion receptor comprises hGABA_BR2*AAA*Gα_o5.

69. (Previously presented) The G-protein fusion receptor of claim 1, wherein the G-protein fusion receptor comprises hGABA_BR1a*AAA*Gα_o5.

70. (Previously presented) The G-protein fusion receptor of claim 1, wherein the G-protein fusion receptor comprises phmGluR8//CaR*AAA*Gα_i5.

71. (Previously presented) The G-protein fusion receptor of claim 1, wherein the G-protein fusion receptor comprises pmGluR8//CaR*Gα_i5.

72. (Previously presented) The G-protein fusion receptor of claim 1, wherein the G-protein fusion receptor comprises ph8SPmGluR4//CaR*AAA*Gα_i5.